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PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: THIELERT - 7 (PCT)

SERIAL NO.: 10/554,256

PCT NO.: PCT/EP2004/003353

FILED: MARCH 30, 2004

FOR: METHOD FOR PURIFYING COKE WASTE WATER USING A GAS-PERMEABLE MEMBRANE

**SUBMISSION OF INTERNATIONAL PRELIMINARY REPORT**  
**ON PATENTABILITY**

Mail Stop: PCT  
Commissioner For Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

S I R :

Submitted herewith is the International Preliminary Report on Patentability in the above-identified Patent Application.

Respectfully submitted,

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Enclosures: International Preliminary Report on Patentability.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on September 27, 2006.

Kelly Espitia



# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 98 624/Be/AI	<b>FOR FURTHER ACTION</b>		See item 4 below
International application No. PCT/EP2004/003353	International filing date ( <i>day/month/year</i> ) 30 March 2004 (30.03.2004)	Priority date ( <i>day/month/year</i> ) 25 April 2003 (25.04.2003)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant UHDE GMBH			

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).
2. This REPORT consists of a total of 9 sheets, including this cover sheet.  
  
In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- |                                     |              |   |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the report   |
| <input checked="" type="checkbox"/> | Box No. II   | Priority  |
| <input type="checkbox"/>            | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |
| <input type="checkbox"/>            | Box No. IV   | Lack of unity of invention  |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited   |
| <input type="checkbox"/>            | Box No. VII  | Certain defects in the international application  |
| <input checked="" type="checkbox"/> | Box No. VIII | Certain observations on the international application   |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. +41 22 740 14 35	Date of issuance of this report 02 March 2006 (02.03.2006)
	Authorized officer  Agnes Wittmann-Regis  Telephone No. +41 22 338 89 70

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

# PCT

Translation

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

<p>To:</p>		<p>Date of mailing (day/month/year)</p>
<p>Applicant's or agent's file reference <b>98 624/Be/AI</b></p>		<p><b>FOR FURTHER ACTION</b> See paragraph 2 below</p>
<p>International application No. <b>PCT/EP2004/003353</b></p>	<p>International filing date (day/month/year) <b>30.03.2004</b></p>	<p>Priority date (day/month/year) <b>25.04.2003</b></p>
<p>International Patent Classification (IPC) or both national classification and IPC</p>		
<p>Applicant <b>UHDE GMBH</b></p>		

<p>1. This opinion contains indications relating to the following items:</p> <table style="width: 100%;"> <tr> <td style="width: 5%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 25%;">Box No. I</td> <td>Basis of the opinion</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>		<input checked="" type="checkbox"/>	Box No. I	Basis of the opinion	<input checked="" type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application
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<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application																							
<p>2. <b>FURTHER ACTION</b></p> <p>If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.</p> <p>If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.</p> <p>For further options, see Form PCT/ISA/220.</p>																									
<p>3. For further details, see notes to Form PCT/ISA/220.</p>																									

<p>Name and mailing address of the ISA/EP</p>	<p>Authorized officer</p>
<p>Facsimile No.</p>	<p>Telephone No.</p>

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

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Box No. I

Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ in written format

☐ in computer readable form

c. time of filing/furnishing

☐ contained in the international application as filed.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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Box No. II

Priority

1. ☒ The following document has not yet been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>1-8</u>	YES
	Claims _____	NO
Inventive step (IS)	Claims _____	YES
	Claims <u>1-8</u>	NO
Industrial applicability (IA)	Claims <u>1-8</u>	YES
	Claims _____	NO

2. Citations and explanations:

1. Reference is made to the following documents:

D1: US-A-4 746 435

D2: US-A-2002/020666

D3: BRINDLE K ET AL: "Nitrification and oxygen utilization in a membrane aeration bioreactor"  
JOURNAL OF MEMBRANE SCIENCE, ELSEVIER  
SCIENTIFIC PUBL. COMPANY. AMSTERDAM, NL.  
Vol. 144, No. 1-2, 10 June 1998 (1998-06-10),  
pages 197-209, XP004123666 ISSN: 0376-7388

D4: WO-A-97/14658

D5: US-B-6 183 6431

D6: DE-A-20 02 926

D7: EP-A-0 273 174.

2. The present application does not satisfy the requirements of PCT Article 33(1), because the subject matter of claim 1 is not based on an inventive step (Article 33(3)). The reasons are as follows:

Document D1 is considered to be the closest prior art to the subject matter of claim 1. It discloses a

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Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

method for the biological purification of wastewater which contains nitrogen and sources of biological oxygen demand. In the method, the water to be treated is circulated through a treatment tank having a gas-permeable hollow fibre membrane which serves as support for a biofilm. The biofilm is formed on the membrane side facing the water, whereas oxygen-containing gas is passed to the other membrane side facing away from the water to supply the microorganisms on each side of the membrane with oxygen. In the biofilm, both aerobic and anaerobic microorganisms are present which simultaneously degrade the pollutants by nitrification and denitrification (D1: column 3, lines 7-65; column 4, lines 59-64; column 5, lines 9-55).

The subject matter of claim 1 differs from the method disclosed by D1 in that "coke wastewater", which is charged with nitrogen compounds, cyanides and sulphides is treated.

The term "coke wastewater", however, does not define a technical feature which would make this water actually differentiable from the wastewater designated in D1. Specifization in concrete terms of the water as charged with nitrogen compounds is, on the other hand, already explicitly mentioned in D1 (D1: column 4, lines 59-64). In addition, D1 also already mentions pollution by sources of biological oxygen demand which also comprise cyanides and sulphides. The specific use of wastewater which is contaminated, inter alia, with cyanides and

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Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
statements and explanations supporting such statement

sulphides, therefore, in the light of D1, appears to be an obvious selection of a type of wastewater which a person skilled in the art would make without inventive step on the basis of considerations familiar to him or her. This appears to be the more obvious, since the use of supported microorganisms for the biological purification of what is termed coke water, or wastewater polluted by cyanides or sulphides, is already disclosed by the prior art (D4: page 4, 2nd paragraph; D5: column 2, lines 16-23; column 4, lines 32-41; D6: claims 1 and 2). A person skilled in the art, in knowledge of the teaching of D1, arrives at the subject matter of claim 1 without further problem.

The subject matter of claim 1 does not therefore appear to be based on an inventive step (PCT Article 33(3)).

In addition, D2 and D3 could likewise be considered as closest prior art. Both documents disclose a biological purification method of the above defined type having a biofilm on a gas-permeable membrane through which oxygen is passed (D2: page 1, paragraph 1; page 7, paragraph 93, paragraphs 105-107; fig. 13; D3: pages 197-198; page 200, 3. Experimental - page 201, left column, 3rd paragraph). Although the membrane in D2 does not have a tubular shape, in contrast to that in D1 (D1: hollow yarn; D2: sheet), this geometrical difference appears to lie within the scope of routine measures to a person skilled in the art and not to have any



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surprising technical effects. D3 only mentions nitrogen as contaminant to be removed. However, this indication appears to be sufficient in order to consider as obvious the treatment of inter alia nitrogen-containing "coke wastewater" in the method of D3. The subject matter of claim 1 therefore also does not appear to be based on an inventive step (PCT Article 33(3)) in view of D2 or D3.

3. Dependent claims 2-8 do not contain any features which, in combination with the features of any claim to which they refer back, meet the PCT requirements for novelty and inventive step. These features are either already disclosed in the documents D1-D3 and D7, or are measures which are obvious to a person skilled in the art; see documents D1-D3 and also D7, and the corresponding text references given in the search report.

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Box No. VIII      Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

4.      In addition, it is not clear in claim 1 in respect to what the nitrification is to be selective (PCT Article 6).